EXPRESSION OF INTEREST

EoI Reference no. OIL/PROJECTS/FHQ/2024/TF/EOI-591 **19.12.2024**

LAST DATE OF SUBMISSION: 17:00 HRS (IST) OF 09.01.2025

Sub: Notice Invitation "Expression of Interest (EoI)" for Technical Proposal from SPSU/ CPSU in India for Hiring EPMC services for construction of "A Tank Farm of capacity 60,000 KL at Naoholia, Dist.-Dibrugarh-Assam" and "A Secondary Tank Farm of capacity 30,000 KL at Moran, Dist.-Charaideo-Assam"

1.0 INTRODUCTION:

Oil India Limited (OIL) (*hereafter called "the Company*"), a fully integrated energy company in the upstream, midstream & downstream oil & gas sector, with origin dating back to the glorious year (1889) of oil discovery in India. OIL is a Maharatna PSU Company, under the administrative control of the Ministry of Petroleum and Natural Gas, India and is the second largest national E&P oil and gas company in India. The company has its Corporate Office in Noida, Uttar Pradesh, and Field Headquarters at Duliajan, Assam. Duliajan is well connected by Air with the nearest Airport being at Dibrugarh, 45 km away. The company has a significant presence across the entire value chain in the hydrocarbon sector.

Currently, the company is focused on expanding its crude oil processing and storage capacity within its operational areas in Upper Assam.

2.0 OBJECTIVE:

2.1 Planned as well as emergency shutdown of downstream crude oil refineries and disruption of pipeline transportation has led to low ullage availability at existing Tank Farms of the Company, which eventually lead to shut-in of producing wells, hampering the overall production. Further, under Mission 4+ initiative of the Company, crude oil production is also expected to increase in near future. To avoid low ullage situation under the above scenario, crude oil storage capacity augmentation of Tank Farms of the Company is envisaged.

2.2 In this context, for enhancement of bulk storage capacity of crude oil produced in Upper Assam and adjoining areas, the Company is planning to set-up following two crude oil tank farm facilities in Upper Assam:

(i) **Tank Farm at Naoholia (TF-NHL)**: Crude Oil Storage Tank Farm of capacity 60,000 KL at Naoholia under Dibrugarh District, Assam for storage of pre-treated crude oil and final despatch.

(ii) **Secondary Tank Farm at Moran (STF-Moran)**: Construction of a Secondary Crude Oil Storage Tank Farm of capacity 30,000 KL at Moran (STF, Moran), under Chairaideo District, Assam for processing, storage, and dispatch of crude oil.

2.3 Both the above-mentioned projects shall be executed in EPMC + EPC mode.

2.4 The Company intends to engage an "Engineering Project Management Consultant" (*hereafter called "EPMC" or "Bidder*"), from "State Public Sector Undertaking/Central Public Sector Undertaking" in India *(hereafter called "SPSU/CPSU"* having relevant industry experience as detailed in Para 6.0 (below) for both the projects.

3.0 EXPRESSION OF INTEREST:

In consideration of above, **Expression of Interest** for **Technical Proposal** is invited by the Company from Indian *SPSU/CPSU* for Hiring Engineering Project Management Consultancy (EPMC) Services for both the projects-

(i) **Tank Farm at Naoholia (TF-NHL)**
(ii) **Secondary Tank Farm at Moran (STF-Moran)**

Note:

a) Project Site details, Minimum list of facilities required and Scope of work for "Tank Farm at Naoholia (TF-NHL)" project is enclosed as **Annexure-A** and for "Secondary Tank Farm at Moran (STF-Moran)" project is enclosed as **Annexure-B.**
b) Bidder may submit EoI for both the two Projects or may submit EoI for either of the project.

4.0 SITE DATA:

Please refer attached **Annexure-A** and **Annexure-B**.

5.0 SCOPE OF WORK:

Please refer attached **Annexure-A** and **Annexure-B**.

6.0 GENERAL AND PRE-TECHNICAL QUALIFICATION CRITERIA FOR SUBMISSION OF THE EoI:

The proposals received through this Expression of Interest will be evaluated based on the following criteria**:**

a) **General Qualification Criteria**: Bidder must be a State Public Sector Understanding /Central Public Sector Undertaking in India.

b) **Pre-Technical Qualification Criteria**: Bidder must have experience as EPMC/EPCM in engineering, project management & supervision for execution

of "Similar Works" commissioned in last seven (07) years reckoned from the original cut-off date for submission of the EoI.

Definition of "Similar Work":

The term "**Similar Works**" means-

(i) Construction, Erection & Commissioning of crude oil dehydration system of minimum capacity 2,500 KLPD.
(ii) Construction, Erection & Commissioning of floating roof tank of minimum capacity of 20,000 KL for crude oil/petroleum product storage including Control & Instrumentation system, firefighting system and tank farm management system.

Note to the "**Definition of Similar Work":**

Both (i) & (ii) of the "similar works" as stated above may be executed either through same contract or two separate contracts.

In case bidder wish to submit EoI for both Tank Farm Naoholia projects and STF-Moran Project, bidder shall have experience as stated under (i) & (ii).

In case bidder wish to submit EoI for STF Moran project, bidder shall have experience as stated under "(i)" & (ii).

In case bidder wish to submit EoI for only Tank Farm Naoholia project, bidder shall have experience of as stated under (ii).

7.0 GENERAL NOTES:

7.1 All documents submitted along with the EoI should be clear & legible.

7.2 The EoI is liable to be ignored in case of submission of any misleading / false representation by the bidder.

7.3 The EoI shall not indicate any price.

7.4 The Company shall not reimburse or bear the cost incurred by the bidder in connection with the entire EoI process.

7.5 The Company reserves the right to ignore any or all EoIs and to curtail/ enhance the scope of work as stated in attached **Annexure-A & B**, if required, without assigning any reason thereof.

7.6 Details of scope of work, experience and qualification criteria and other requirements of the EOI etc. are available at OIL website www.oil-india.com. All corrigendum, addendum, time extension to the EOI will be hosted in the OIL website and no separate

notification shall be issued in the press. Prospective participants against the EoIs are requested to visit the website regularly to keep themselves updated.

7.7 This EoI is non-binding in nature and submission of information should not be considered as shortlisting / selection for company in any subsequent RFP/ Tender/ Bid process that may be undertaken in future.

7.8 OIL reserves the right to terminate the EoI process at any point of time without assigning reason.

7.9 No participant shall contact the Company on any matter relating to the EOI after the last date of submission of EOI unless requested for so in writing. Any effort by the bidder to influence OIL in the decision making in respect of EOI will result in the rejection of that bidder.

7.10 Based on the responses received against this invitation, a virtual meeting/ offline discussion (as per convenience of the Company) may be held with the responding Bidder to discuss on the information/ views submitted. Date and time shall be intimated separately.

7.11 During the EoI stage, the prima facie technically eligible SPSU/CPSU bidders will be identified and shortlisted. Budgetary quotes will be obtained if a sufficient number of bidders are deemed technically eligible in the EoI stage. Following this, a limited tender will be floated, provided there are enough technically eligible bidders.

7.12 The prima facie technically eligible SPSU/CPSU Bidders during the EOI stage shall be identified and short listed. If sufficient bidders are found technically eligible during the EoI stage, budgetary quotes shall be obtained from all the technically eligible bidders. Subsequently, a limited tender shall be floated, amongst the eligible bidder, with detailed scope of work, BEC/BRC (both technical & financial criteria), QCBS criteria which shall be firmed up considering the inputs received from the participants in the EOI stage.

8.0 SUBMISSION of EoI:

8.1 Interested bidders meeting the pre-qualifying general and technical criteria as above are invited to submit their EOI along with all requisite documents as stated in Para 9.0 below, at our following e-mail ids latest by 09.01.2025 till 17.:00 Hrs (IST):

To: malaydas@oilindia.in
Cc: nribir@oilindia.in,
bikramjit_singha@oilindia.in,
syed_rizaul@oilindia.in
saurabh.baishya@oilindia.in

8.2 OIL reserves the right to (a) accept or reject any/all offers submitted by parties (b) cancel the process at any time without any liability and assigning any reason thereof.

9.0 DOCUMENTS TO BE SUBMITTED BY BIDDER:

Information/documents that should be submitted for the Expression of Interest for the Engineering Project Management Consultant (EPMC) services for the construction of the Tank Farms at Naoholia and Moran are as follows:

9.1 Covering Letter:

A formal letter specifying **EoI Reference no**., **the project(s) the bidder is interested in (either one or both projects), Contact Details (Full name, address, telephone numbers, email IDs, and other relevant contact details of the bidding entity)**. The covering letter should be address to:

CGM-PROJECTS
PROJECTS DEPARTMENT
OIL INDIA LIMITED
P.O. DULIAJAN-786602
DIST. DIBRUGARH, ASSAM, INDIA

9.2 Company Profile AND Financial Information:

The bidder should provide:

(i) Proof of being a SPSU/CPSU (e.g., Registration Certificate, Memorandum of Association, Certificate of Incorporation, etc.).
(ii) A brief company profile including history, operations, key services offered, etc.
(iii) Annual Financial Turnover of the bidder during preceding three financial / accounting years from the original EoI closing date.
(iv) Net worth of applicant as at the end of the preceding financial/ accounting year.

NOTE :

For proof of Annual Turnover & Net worth, any one of the following documents/ photocopies must be submitted along with the bid: -

Audited Balance Sheet along with Profit & Loss account.
OR
A certificate issued by a practicing Chartered / Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed in Proforma-1.

9.3 Experience Documents (Pre-Technical Qualification Criteria):

The bidder must submit relevant documents substantiate their relevant experience as per the criteria mentioned under above **Clause 6.0 b): Pre-Technical Qualification Criteria**:

9.3.1 For Tank Farm at Naoholia (TF-NHL):

If the bidder wishes to submit EoI for **Tank Farm at Naoholia** only:

(i) To provide relevant project details (including project name, location, client, scope of work, capacity, and project commissioning date) substantiate bidder's experience as EPMC/EPCM in engineering, project management & supervision for execution of "Similar Works" related to the floating roof tanks (minimum 20,000 KL) as outlined in the "Definition of Similar Work- (i)."

(ii) To provide supporting documents for at least one similar project completed in the last 7 years, including:

- **Project Completion Certificates/Client Testimonials** from the client confirming the successful execution of the similar work.
- **Project Execution Details**: Relevant pages of contract document stating the details of the EPMC/EPCM services provided, highlighting the role of the bidder in design, execution, supervision, and commissioning.

9.3.2 For Secondary Tank Farm at Moran (STF-Moran):

If the bidder wishes to submit EoI for **Secondary Tank Farm at Moran** only:

(i) To provide Relevant project details (including project name, location, client, scope of work, capacity, and project commissioning date) substantiate bidder's experience as EPMC/EPCM in engineering, project management & supervision for execution of "Similar Works" related to the floating roof tanks (minimum 20,000 KL) and crude oil dehydration systems (minimum capacity 2,500 KLPD) as outlined in the "Definition of Similar Work- (i) & (ii)."

(ii) To provide supporting documents for at least one similar project completed in the last 7 years, including:

- **Project Completion Certificates/Client Testimonials** from the client confirming the successful execution of similar works.
- **Project Execution Details**: Details of the EPMC/EPCM services provided, highlighting the role of the bidder in design, execution, supervision, and commissioning.

9.3.3 For Both Projects (Naoholia + Moran):

If the bidder wishes to submit EoI for both **Tank Farm at Naoholia** and **Secondary Tank Farm at Moran,** bidder should provide relevant documents as stated in **Clause no. 9.3.2** above.

9.4 Technical Capability and Approach:

Detailed methodology and approach for managing the projects (TF-NHL and/or STF-Moran). This should include:

(i) Project planning including plan for basic engineering, cost estimation, tender preparation for hiring EPC services, bid evaluation and recommendation for award of EPC, execution strategies, risk management, and project control mechanisms.

(ii) Resource planning and mobilization strategy.

(iii) Quality assurance and quality control procedures to be followed during project execution.

(iv) Project execution timeline for TF-NHL and/or STF-Moran.

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Proforma 1

CERTIFICATE OF ANNUAL TURNOVER & NET WORTH

TO BE ISSUED BY PRACTISING **CHARTERED ACCOUNTANTS' FIRM** ON THEIR LETTER HEAD

TO WHOM IT MAY CONCERN

This is to certify that the following financial positions extracted from the audited financial statements of ..... (Name of the Bidder) for the last three (3) completed accounting years upto .....**(as the case may be)** are correct.

YEAR	**TURN OVER** In INR (Rs.)	**NET WORTH** In INR (Rs.)

Place:
Date:

Seal:

Membership Number and Firm Registration Number :
Signature

----------xxxx----------

Annexure-A
Scope of Work (SoW) -Tank Farm Naoholia

1.0 Objective:

Oil India Limited (OIL) desires to construct a Crude Oil Storage Tank Farm having storage capacity of around 60,000 KL for bulk storage of crude oil at Naoholia, Mouza Tipling, under Dibrugarh District, Assam. The area earmarked for this project is located at approximately 10 km from OIL's Field Headquarter, Duliajan. (Co-ordinates: N= 27°22'57.91", E=95°21'35.41"). The total area of the plot is 160 Bigha approximately. A copy of the land map is provided in below Para no. 6. The project is planned to be executed in EPMC+EPC mode.

EPMC to provide Services for this Tank Farm project in accordance with the given Scope of Work (SoW) included in this section. This section establishes the scope of work to be performed by the EPMC and describes the guidelines, instructions etc., which the EPMC shall satisfy or adhere to in the performance of the work.

The scope of work as indicated and elaborated hereunder is for general understanding and are not exhaustive. The BIDDER has to carry out all activities for completion of the project in totality.

Typical climatic condition of the region:

Month	**Average Rainfall (in cm)**	**Average ambient temp. high/Average low (in deg C)**
January	3.7	24 /11
February	5.4	25/13
March	10.5	27/17
April	19.2	28/20
May	30.1	31/24
June	32.7	33/27
July	38.1	34/28
August	32.9	34/28
September	27.9	33/26
October	13.0	31/22
November	3.6	28/16
December	2.2	25/12
Average	18.275	29.42/20.33

2.0 Basic process philosophy for the proposed Tank Farm, Naoholia:

Tank Farm, Naoholia will be used for storage of pre-treated dry crude oil only. Tank Farm, Naoholia will receive dry crude oil at the rate of 542KL/hr (maximum) from OIL's nearby tank farm facility namely Secondary Tank Farm (STF), Madhuban located at approximately 3 KM. Incoming crude oil will be preheated and stored in dry crude oil storage tanks. Dry crude from the Tank Farm, Naoholia will be dispatched to CTF, Duliajan/ Pump Station-1 at the rate of 542KL/hr(maximum) for final dispatch to refineries. Design and installation of **wet crude handling system** (wet crude oil storage tanks, crude oil dehydration facility including recirculation/recharging pumps, bath heaters for wet crude oil, electrostatic emulsion treaters etc) and **formation water handling, treatment, desalination and disposal/injection system** (Untreated Formation Water Tanks, ETP, Treated Formation Water Storage Tanks, Treated Formation Water Disposal/Water injection pumping systems, Desalination Plant) is not included in the current scope of the project. EPMC to consider only space provision in terms of adequate inter distance shall be kept as per OISD-118, so that installation of crude oil dehydration facility and formation water treatment & handling systems including interconnecting process piping may be installed in future as well as for application of the PESO license. To ensure adequate space provision is considered, an indicative layout of the crude oil dehydration facility and formation water treatment & handling systems including interconnecting process piping needs to be shown in basic plot plan of the Tank Farm, Naoholia which is to be developed by EPMC in FEED/Basic Engineering stage.

Note: Dry crude oil inlet as well as despatch crude oil pipelines are excluded from this tender scope. Only tie -in flange with positive isolation valve for hooking up the pipelines are to be considered.

2.1 **FEED data for assessment of requirement of optimum space provision for future crude oil dehydration facility & formation water treatment & handling system:**

i) 600 Class wet crude oil inlet manifold for receiving 13,000 KLPD wet crude oil.

ii) Capacity of wet crude oil storage tanks- EPMC to suggest.

iii) Capacity of crude oil dehydration facility: For handing 13000 KLPD wet crude oil (BS&W 50% maximum). 4 nos x 25% capacity dehydration trains.

iv) Capacity of untreated formation water storage tank: EPMC to suggest.

v) ETP & Desalination plant capacity including no. of trains: EPMC to suggest.

vi) Treated formation water storage tanks: EPMC to suggest.

vii) Capacity of Treated Formation Water disposal pumping system: EPMC to

suggest including tentative no. of disposal pumps.

viii) Treated formation water transfer pumping system to transfer water to downstream Water Injection Stations located at maximum distance of around 20 KM.

3.0 Design standards to be considered:

The tank farm shall be design by considering applicable relevant codes, standards, any other national & international level Codes & Standards applicable for design and construction of Crude Oil Tank Farm Installations but not limited to the following:

(a) OMR (Oil Mines Regulations)
(b) Applicable OISD Standards (OISD 117, 118 etc)
(c) Indian Boiler Act guidelines
(d) Applicable IS codes.
(e) Recommendations of OISD (Oil Industry Safety Directorate)
(f) CMRI (Central Mining Research Institute)
(g) DGMS (Director General of Mines and Safety)
(h) PESO (Petroleum & Explosives Safety Organisation)
(i) Ministry of Environment and Forest (MOEF)
(j) State Pollution Control Board
(k) LMD (Legal Metrological Departments)
(l) MB Lal committee recommendation
(m) Hazira committee recommendation
(n) NPFA 72 & NPFA 2001
(o) API 650, API 610, API 674, API 676 and all API standards applicable for selection pumps, agitators, tank construction and all major items & equipment.
(p) Applicable ASME code.
(q) Latest applicable QHSE-ISO and International Safety Rating System (ISRS; Minimum Level-7 ISRS).
(r) Other relevant laws, by-laws, or Acts in force
(s) Any other national & international level Codes & Standards applicable for Crude Oil Tank Farm Installations
(t) Central Electricity Authority, Ministry of Power

4.0 Minimum list of facilities envisaged in this project but not limited to the following:

List of facilities and ancillaries required to be considered in FEED/Basic engineering design for the Crude Oil Storage Tank Farm at Naoholia but not limited to the following (EPMC shall consider any additional facilities in the basic engineering design for safe and efficient operation of the Tank Farm): -

4.1 **Dry Crude Oil Storage Tanks –**

The tank farm shall have dry crude oil storage capacity of around 60,000 KL. Combination of 10,000 KL & 20,000 KL capacity floating roof API 650 crude oil storage tanks are preferable. The capacity of proposed tanks as mentioned herein is not to be considered as final. EPMC shall give exact

capacity of tanks with due consideration of space availability. EPMC may also suggest combination of floating and fixed roof tanks based on tank dimensions. Based on land shape and space availability, EPMC to suggest exact capacity of dry crude storage tanks and number of tanks feasible to be installed inside the project build up area. The tank design shall comply with all statutory norms & requirements (OISD-STD-117, OISD-STD-118, OISD 189, MB Lal Committee recommendation and any other relevant codes and standards). Impressed current cathodic protection (ICCP) system shall be considered in the design. Tank dykes for spilled containment are also to be considered. EPMC to suggest a suitable type of floating roof tank i.e., either double deck type or pontoon type.

4.2 **Crude Oil Despatch Pumping System (CODP system) with structural shed: -**

Stored dry crude oil from the dry crude storage tanks of total capacity around 60,000 KL will be dispatched to CTF, Duliajan/PS-1 through approximately 16 km long 12-inch nom. dia pipeline with the help of EMD crude oil despatch pumps (CODP). Installation of diaphragm type seal less pumps**/**centrifugal pumps conform to API 676/674 shall be explored by EPMC for CODP system. COD Pumps shall be LT (415V) motor driven. Motors Starters for the motors rated more than 40HP shall be Soft Starters or VFD. CODP system shall be equipped with suitable sized adequate quantities of COD pumps including 50% standby to transfer 13,000 KLPD crude oil. All the COD pumps shall be identical capacity/rating and same make. The pump units must be isolated by the sound barrier to arrest any sound pollution to the optimum level (i.e. 75 db at one meter distance from acoustic enclosure). Enclosure, if provided, should have adequate space inside the enclosure for movement of maintenance crew for carrying out scheduled/ unscheduled and major breakdown maintenances involving removal and assembling of heavy pump components within the enclosure. Enclosure should have adequate ventilation options for maintenance works and should have provision of easily removable parts or top open type with minimum involvement of shifting electrical/air/ other system lines for safe and easy transfer of heavy components/ complete pump/ gear box/ motor assembly. Walkways around the equipment should be designed for safe and unrestricted movement of manpower with tools.

EPMC also shall consider EMD centrifugal type Booster/Charge pumping system in the basic engineering design to meet NPSH requirement for each COD pump. 50% standby philosophy shall be considered for Booster/Charge pumps. All the Booster/Charge pumps shall be identical capacity/rating and same make. DCS shall be considered for monitoring and control operations of all the CODP and Booster pumps from the Control Room. Local push button station (LPBS) also shall be considered for each CODP and booster pump operations. All critical operating parameters of CODP & BOOSTER PUMPS (pump suction pressure, pump discharge pressure, pump discharge rate, motor RPM, voltage, current etc) shall be displayed in the control room.

Adequately sized pre-engineered structural sheds or site fabricated structural shed shall be considered for the entire CODP system including

booster pumps. Additional floor space shall be considered for carrying out regular maintenance/breakdown repairing/overhauling of one pumping unit inside the pump shed. The pump shed shall have EOT crane of adequate capacity with palm top facility for lifting each CODP unit along with prime mover. The shed shall have removable parts for lifting of the pump/ gear box/ motor assemblies through mobile cranes. There should be adequate space and accessibility to movement of crane and heavy vehicles along the CODP equipment area.

There should be proper drainage system in and around CODP area to cater to all probable fluid spillage / draining locations.

It suggested that minimum tank crude oil level or tank foundation level to be maintained above CODP suction level as per the requirement of the pump manufacturer to avoid suction starvation. Suction and delivery pipelines should have minimum flow restrictions to ensure smooth flow. Number of bends in the suction line of the CODP's should be as minimum as possible.

Supply of mandatory and critical spares for 02 years of scheduled and unscheduled/ emergency maintenance for each of the complete CODP system should be included in EPC contractor's scope.

4.3 **Distributed Control System:**

DCS based C&I system shall be considered for the plant. Controls and Status (Running / Standby / Trip / Start Permissive etc.) of all the COD Pumps & Motors, charge/booster pumps & motors, all other utility pumps & motors, fire pumps, EDG, tank inlet & outlet ROSOV, MOV operation, tank level display, tank status display, display running/standby status of steam generating boiler, display all operating parameters of rotating equipment (pressure, temperature, RPM, voltage etc), crude oil despatch rate shall be incorporated in the DCS for monitoring and controlling from the Control Room.

Following control system envisaged for the tank farm-

- ✓ Tank farm management system (TFMS)
- ✓ Basic process control system (BPCS)
- ✓ Fire water Protection system
- ✓ Rim seal fire protection & suppression system
- ✓ ESD system (Emergency shut down/SIS)
- ✓ Flame and Gas Detection system (F&G/SIS)

DCS should be compatible for establishing communication between the two basic process control system (BPCS) of the tank farms (STF Madhuban and Tank Farm, Naoholia) as well as Pump Station-1 (PS-1), Duliajan. Aerial distance between Tank Farm Naoholia site and STF Madhuban is 3.5 KM approximately and aerial distance between Tank Farm Naoholia site and PS-1 is 6.0 KM approximately.

Establishing communication between BPCS of TF, Naoholia with STF Madhuban as well as with PS-1, Duliajan shall be included in EPC contractor's scope.

Details of Basic Process Control System (BPCS) at STF MADHUBAN:

Yokogawa (DCS) Centum VP Communication Protocol (s)

* Foundation Fieldbus, VNET-IP
*HART Conventional 4-20mA loop
* OPC DA
* Modbus RS-485
* Modbus TCP/IP
* Modbus TRL/2

(Data connectivity between STF Madhuban & PS-1 is Modbus TCP/IP through radio communication)

Details of Basic Process Control System (BPCS) at PS-1:

Yokogawa (PLC) Prosafe-RS

Stardom RTU

Communication Protocol (s):

* VNET-IP
*HART Conventional 4-20mA loop
* OPC DA
* Modbus TCP/IP

4.4 **Electrical Power Supply:**

For required electrical power supply, EPMC to explore and analyse the following options:

(1) Taking entire electrical load of the plant from nearby grid of Assam Power Distribution Company Limited (APDCL, A unit of Assam State Govt.)
(2) Taking Power Supply from the existing nearby network of OIL (OCS 4 Sub-Station or GCS 4 Sub-Station)
(3) Dedicated Captive Power Plant

While evaluating different options, EPMC to prepare a detailed report of the technical feasibility against each options along with cost benefit analysis taking into account all associated implementation and O&M costs.

One No. Emergency Gas/Diesel Engine Driven Genset shall be considered for all the critical loads of the plant (Tank Farm).

When designing electrical switchgear, a sufficient number of feeders, incomers, and motor starters should be kept as spares against each rating. The spare quantity should be either 20% or at least one unit, whichever is greater.

In the captive power plant (CPP), Gas Engine Generators (GEG) must be properly sized to guarantee its operation within the optimal performance range at all times. The load on an operating GEG should never fall below 30% of its rated capacity. Utmost care shall be taken by the EPMC and EPC Contractor, to ensure that the OEM-recommended minimum load for

continuous operation is consistently available for the GEG. To maintain the necessary load levels on active GEG/GEGs, appropriately rated multiple GEGs with synchronisation & parallel operation facility shall be considered in the CPP. Should OIL encounter an operational issue/problem in the CPP due to insufficient load on the GEG after commissioning, OIL reserves the right to request that the EPMC/EPC Contractor perform any essential modifications or changes at no additional cost to OIL.

If the capacity of an individual GEG exceed 1 MW or the combined capacity of all GEGs in the CPP (excluding the emergency GEG) surpass 2 MW, 11kV high voltage generation shall be considered.

4.5 **Crude oil heating system-**

Steam Generating Boiler for tank heating and process piping (100 % standby philosophy shall be considered if 01 boiler is sufficient for regular operation, 33% standby philosophy shall be considered if 02 boilers are required for regular operation and 50 % standby philosophy shall be considered if 04 boilers are required for regular operation). Use of mobile steam generating boiler may be explored by EPMC. If feasible, mobile boilers are preferable.

4.6 **Fire Protection System & Fire Fighting System:**

4.6.1 The proposed Tank Farm at Naoholia shall be equipped with state-of-the-art firefighting facilities which should include Fire Pumps (Diesel engine driven, electric driven& jockey pumps), Fire Water Network, Foam Pumps, water spray system (Deluge Valves), Foam Pouring System, MEFGs, Rim Seal Fire Protection System, Hydrants (With Fire Hose Box), Monitors, HVLRMs, Fire Detection & Alarm System, Clean Agent Fire Suppression System, Portable firefighting equipment(Fire Extinguishers, Delivery Hoses, Multi-purpose Nozzles), PA or Communication System, etc. as per applicable & latest codes & standard but not limited to the following OMR-2017,OISD-STD-16/117/163/173/129/etc.,NPFA-72/25/20/ 2001/ etc., API-650 /2218 /etc., BIS- 15683 /16018 /4308 /636 /etc. and PNGRB Regulations etc..

Lightening Protection System shall be considered in basic engineering and the same shall be vetted by Electrical Department, OIL.

4.6.2 The fire water system shall be designed based on two largest fire contingencies simultaneously where total storage capacity is more than 30,000 KL.

The fire water storage shall be above ground for four (4) hours capacity of total hourly fire water pumping requirement.

Entire areas of the tank farm shall be covered with Fire Water network and pressurized through fire pumps conforming to

NFPA/BIS standard with hydro-pneumatic facilities (Hydro-pneumatic tank & Air Compressor). All the pumps shall be identical and of the same make. All the pumps shall be in auto-mode. The minimum pressure of 7 Kg/cm2 shall be maintained at a hydraulically remotest point of fire water network.

The jockey pump shall start automatically when level in the hydro-pneumatic tank falls below the low level and shall stop when normal level in the tank has been restored. Pressure switches are to be provided in the hydro-pneumatic tank for automatic operation of the air compressor.

Moreover, for jockey pump duty type of the motor shall be selected based on the cycle of operation of the jockey pump. If felt, a timer can be introduced in the control circuit to keep the motor running for a predetermined time after each automatic start to avoid too frequent motor operation.

4.6.3 The hydrants (BIS-5290), water cum foam monitors (UL Listed) & HVLRMs (UL Listed) shall be considered in the design at a regular spacing as per the relevant norms with fire hose boxes (FRP) along with type 'III' synthetic hoses (BIS-636) and multi-purpose nozzles (UL Listed/FM Approved).

4.6.4 Water spray system shall be designed as per NFPA-25.

4.6.5 Foam system shall be designed as per NFPA-11 and OISD-STD-116/117.The same shall be of fixed and semi-fixed type with centralized foam facilities including foam storage tank (UL listed foam), foam pumps, foam pouring system, etc. and foam ring main around the tank dyke area with online foam induction arrangement through suitable foam inductor/proportioner (ILBP).

Also, the provision for alternate foam pouring arrangement from Fire Tender shall be considered in the design.

All the foam systems, piping, fittings, foam tanks etc. shall be of stainless steel (SS-316/304) of suitable grade.

Rim seal fire protection system shall be considered in the design as per OISD-STD-116/117.

MEFG shall be considered in the design for spillage protection inside the dyke.

4.6.6 All other miscellaneous items related to fire & safety shall be considered as per relevant norms.

4.6.7 Entire area shall be covered with fire detection and alarm system along with public address system at control room with manual call

points at strategic areas/location.

4.6.8 A clean agent fire suppression system shall be considered as per NFPA-2001.

4.6.9 Future dehydration facility and formation water handing & treatment facility also shall be considered in fixed firefighting system design. Accordingly, water reservoir capacity shall be design for full-fledged tank farm facility including about 60,000 KL dry crude storage tanks, future wet crude storage tank, crude oil dehydration trains, ETP and all ancillary facilities of the Tank Farm, Naoholia.

4.7 **Instrument & Utility Air Supply**: For supplying instrument air to all pneumatically control instruments, EPMC to suggest/consider adequate capacity & pressure rated Oil Injected Type Screw Compressor. Based on actual instrument air requirement, EPMC to suggest either 1 (operating)+ 1 (stand by) or 2 (operating)+ 1 (stand by) or 3 (operating)+ 2 (stand by) air compressors.

It is suggested that minimum 02 nos. (or more based on no. in operation) stand by air compressor along with adequate standby air dryer systems should be considered, due to the critical nature of the equipment.

The site shall be made easy accessibility for the loading and unloading of compressor packages and its accessories with sufficient working space between the equipment for safe and efficient operation and maintenance.

4.8 **RCC Office building and Control Room Building**: Administrative Office/Plant in charge building shall be designed as per OISD STD 163 Clause no. 5.2. The building shall have one (01) Plant In-charge room, one (01) shift in-charge room, five (05) nos. discipline engineers' room, one (01) office assistant room on the first floor. Adequate nos. of separate gents' toilet and ladies toilet shall be considered in the building. Septic tank shall be designed for 15 persons.

The control room building shall be designed as per OISD-STD-163 and OISD-STD-118 on the ground floor. The size of the control room shall be adequate for integration of C&I system of future crude oil dehydration facility & formation water treatment & handling system.

Note: Two separate RCC buildings shall be considered for the Office building and Control Room Building. The control room building shall be a single storied building. For Office building, EPMC to decide whether single or double storied depending on office accommodation requirements.

4.9 **RCC Sub-station building:**

A RCC Electrical Sub-Station building including all HT switchgear panel, LT switchgear panel, lighting transformer, LDB etc shall be considered in the design to feed Electrical Power Supply to entire process, ancillaries,

utilities, buildings, sheds. Size of the sub-station building shall be adequate for installation of LT panels for feeding power supply to future crude oil dehydration facility and formation water handling & treatment facilities.

4.10 **Structural maintenance shed** (Size: 40 ft x 20 ft, indicative)

4.11 **Structural Equipment Storage Shed** (Size: 25 ft x 15 ft, indicative)

4.12 **POL Storage Shed** (Size: 25 ft x 15 ft, indicative)

Note: All structural shed may be either pre-engineered structural shed or site fabricated structural shed.

4.13 **Water supply system:**

a) Source of water: Ground water (Deep Tube Well / Shallow Tube Well)

b) Requirements of water : Potable water (as per BIS 10500)
& Industrial water

Necessary arrangements are to be considered for treatment of raw water including iron removal filtration system (two trains to be considered, one running & one stand-by).

b1) Potable water: Potable water will be required to cater 40 persons at a time. Out of these 40 persons, 30 persons will be from security that will be staying inside plant boundary in security barrack.

b2) Industrial Water: Industrial water will be required for different equipment as per design / requirement of the plant. Special arrangement will be required to make the industrial water Iron free along with other treatment processes deemed fit for industrial **purpose.**

c) Overhead water storage Tank: Two separate Overhead Storage tanks of adequate capacity for potable and industrial water should be provided

- One for storage of potable water (in two compartments).
- One for storage of industrial water (in two compartments).

Note: Filtration systems shall be considered for drinking water and industrial water excluding fire water systems.

Report on Raw ground water parameters of nearby OIL installation STF-Moran is given below for reference purpose:

Characteristics	Unit	Test Results	Test Method/ Instrument Used
pH	-	7.2	Metrohm pH Meter

TDS	mg/l	112	Gravimetric Method
TSS	mg/l	136	Gravimetric Method
Iron (as Fe^{++})	mg/l	2.04	UV-vis Spectrophotometer
Total Hardness as $CaCO_3$	mg/l	84	Titration with EDTA
Oil and Grease	mg/l	Nil	Horiba oil content analyser
Turbidity	NTU	40.8	Turbidity meter

4.14 **Civil Foundation:** Civil foundation for all tanks, structural sheds, pipe rack, cable trench, mechanical, electrical & instrumentation systems/equipment envisaged for Tank Farm Naoholia.

4.15 **Boundary Wall**: 10+2 ft high Peripheral Boundary Wall including 2 ft high Y-angle framed concertina coil atop the wall shall be considered. Boundary wall shall have one main Entry gate and one emergency Exit gate. EPMC may suggest either of the following types of boundary wall- Brick type or pre-fabricated RCC slab type boundary wall. OISD 118 to be followed for maintaining minimum distance from the boundary wall.

4.16 **Road & Drainage System:** Development of main entry road, ring roads, internal road and drainage systems shall be considered with zero liquid discharge outside the plant area. RCC Block Road shall be considered. Carriage width of the plant approach road (from main road to the entry gate and from exit gate to main road) shall be 5 m with 1 m side berm on either side. Carriage width of the plant ring road shall be 4.5 m with 1 m side berm on either side. Carriage width of the plant internal road shall be 4 m with 1 m side berm on either side.

4.17 **Security Check Post & Security Watch Tower**:

One RCC security check post (size 3 m x 3 m) near entry gate and one near emergency exit gate shall be considered.

Adequate nos. of structural steel security watch towers shall be considered in the design.

4.18 **Security Barrack**: Suitable industry standard security barrack shall be considered for 30* security personnel. The barrack shall have dining hall for 10* persons. The barrack shall have one strong room for arms & ammunition. There shall be space provision for development of recreational facility like badminton court & volleyball court.

* Capacity will be finalized during FEED preparation.

4.19 **Development of Green Belt:** EPMC to consider green belt in the design as per CPCB/SPCB norms and any other relevant norms.

4.20 **CCTV System with recording & transmission facility:** Intrinsically safe CCTV system suitable for Oil and Gas plant shall be considered in the design. Adequate nos. of CC camera shall be considered for coverage of critical process areas, near entry & exit gate, pump shed, control room, GEG shed, lobby area of office building. CC camera also shall be

considered at strategic locations for surveillance of outside plant boundary wall nearby areas. The memory card of CC tv system shall capable of storing data for minimum 30 days period. The system shall contain on LED Display screen for real time displaying of all camera output.

4.21 **High Mast and Area Lighting**: LED lights shall be considered for all high mast and area lights.

4.22 **Lightning Protection**: Design and implementation of appropriate lightning protection systems for the entire plant (covering all the structures, buildings etc.) as per statutory requirements and IS/IEC 62305 shall be considered in the design. This also includes installation of bypass conductors on floating roof tanks and lightning protection to all the crude oil storage tanks as per requirements of OISD-GDN-180.A comprehensive report of all the installed lightning protections installed in the plant, along with risk assessment shall be handed over to OIL, for future O&M purpose.

4.23 **Earthing:** All the earthing works shall be as conforming to IS 3043-2018 and IS/IEC 62305.

5.0 Scope of work for the EPMC service:

As an EPMC for the job, the consultant shall act as an extended hand of OIL, always keeping in view OIL's interests and advising/guiding OIL on all important matters and efforts should be given for timely completion of the project. The scope of work of EPMC is outlined below. However, the list is not exclusive/exhaustive and limited. EPMC shall also be required to do the work as a consultancy service provider not envisaged herein and specifically mentioned below, but otherwise required for overall completion of the project.

Scope of work (SoW) in brief for the EPMC service are mentioned in below para-"***a) SoW- Pre award of EPC contract"*** and "***b) SoW- post award of EPC contract"*** for quick understanding.

a) SoW- Pre award of EPC contract (SOR&P Line Items 10 to 50):

- Conceptual design.
- Preparation of Basic design & FEED of the plant.
- Field survey for collection of HFL, NGL etc& finalization of FGL.
- Soil investigation/soil testing, contour mapping/ topographical survey, hydrological survey.
- Conducting safety studies on basic engineering (HAZOP, HAZID, SIL, QRA).
- Preparation of L4 project schedule for all EPC activities till commissioning & PGTR and recommend optimum EPC timeline for the project.

- Preparation of cost estimate for EPC tender,
- Preparation of EPC tender document for hiring EPC services for carrying out Detailed Engineering, Procurement, Construction, Fabrication, Erection & Commissioining in accordance with the terms of the EPC contract.
- Attending pre-bid meeting for the EPC tender. EPMC shall preside the pre-bid meeting and record minutes of meeting.
- Preparation of pre-bid queries response.
- Evaluation/scrutiny of techno-commercial bids received against the EPC tender and recommendation for opening of price bids of techno-commercially accepted bids.
- Evaluation of price bids & recommendation for award of the EPC contract for the suitable bid.
- Preparation and submission of EPC Contract Agreement to OIL.

b) SoW- post award of EPC contract (SOR&P Line Items 60 to 80):

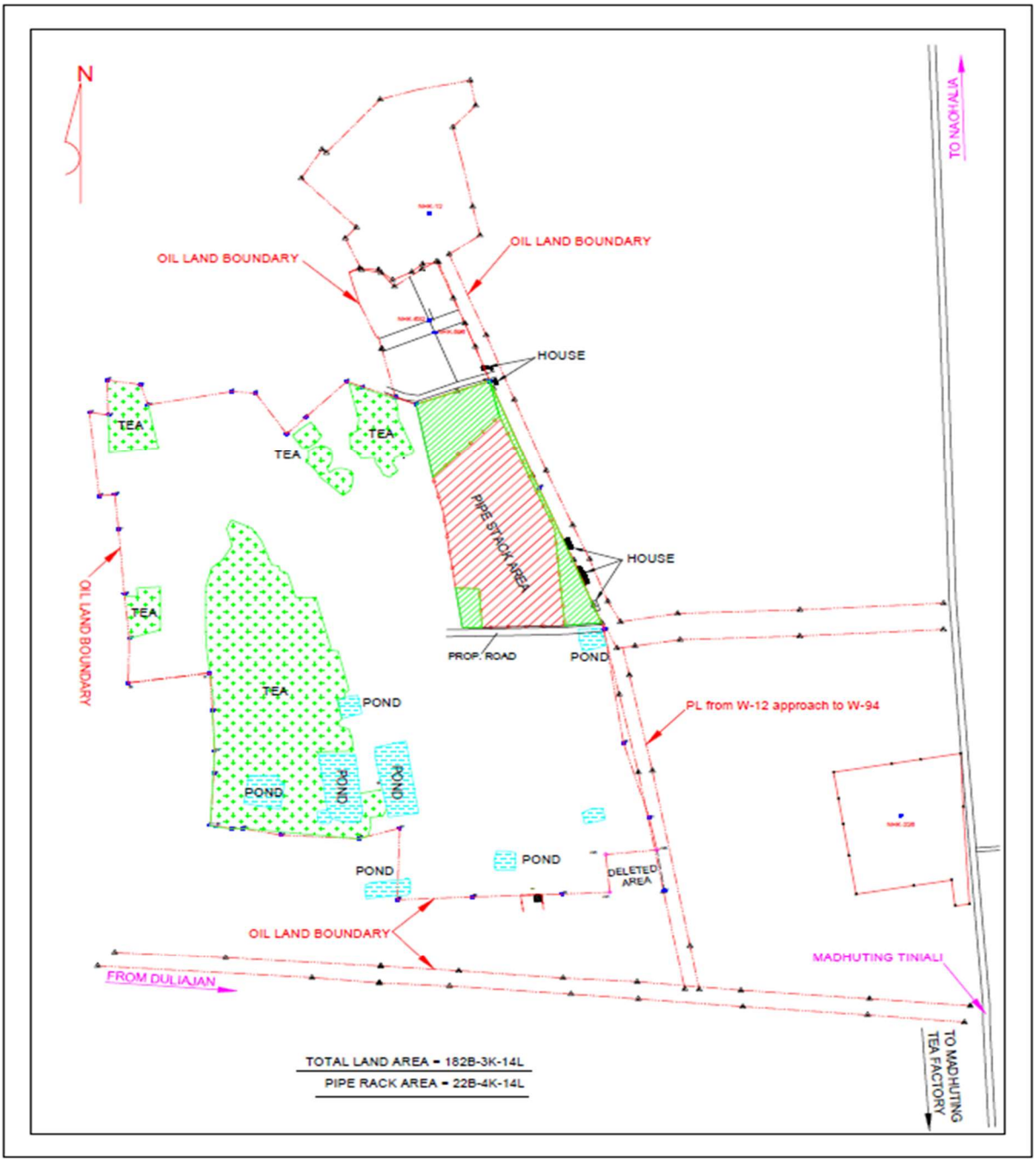
- Kick-off meeting with EPC.
- Review and approve all detailed engineering drawing & documents of EPC contractor,
- Validation of design data,
- To attend safety studies-HAZOP, HAZID, SIL, QRA on Detailed Engineering at EPC contractor's place.
- To attend 30%, 60% & 90% model review meeting at EPC contractor's place
- To review and approve 30%, 60% & 90% model,
- Verification of OEM drawing & documents,
- To give manufacturing clearance,
- Witness FAT of materials & equipment whenever instructed by OIL,
- Review of MTC/FAT report of all materials & equipment, issue/review IRN, issue MDCC to EPC contractor prior to dispatch of major materials & equipment identified as per Inspection Categorization Plan (ICP) approved by EPMC for materials and equipment to be used,
- Inspection of incoming materials at site prior to use for construction/erection/installation,
- Stage wise inspection of all site construction activities to ensure all activities are being carried out by EPC contractor in accordance with AFC

drawings and in accordance with the terms of EPC contract.

- Generation of IMIR,
- Review of daily progress, conduct weekly progress review meeting (WPR) with EPC, conduct monthly progress review meeting (MPR) with EPC, prepare catch-up plan for delayed activities in consultation with EPC
- Certification of monthly invoice of EPC contractor prior to release payment to EPC contractor by OIL,
- Verification of compliance of Statutory requirements,
- Verification of compliance of various standards applicable for oilfield equipment and installations,
- Verification of compliance of all applicable statutory regulations. Statutory norms and standards to be considered are not limited to the following- OMR, OISD, India Boiler Rules, IB Norms, CPCB/SPCB, NPFA, PESO etc.
- EPMC also shall monitor, supervise & certify all site construction activities of EPC contractor right from the beginning of site mobilization activities of EPC contractor till project commissioning, PGTR and project completion to ensure safety, quality and workmanship of entire construction works as well as reliability of the plant.
- Preparation and submission of **Quarterly Delay Analysis Report** of EPC contract (if any).
- Review and approval of As-built drawings.
- EPMC shall prepare Project Closure report including final delay analysis of EPC contractor (if any).

6.0 Proposed Site Land Map

Land Map



Note:
1. Pipe stack area will not be utilized for the project.

End of Annexure-A

Annexure-B
Scope of Work (SoW) -STF Moran

Annexure-B: SCOPE OF WORK (SoW)

1.0 OBJECTIVE:

Oil India Limited (OIL) desires to construct a Secondary Crude Oil Storage Tank Farm having storage capacity of around 30,000 KL for bulk storage of crude oil at Moran under Chraideo District, Assam. The area earmarked for this project is located inside OIL's Township, Moran (Co-ordinates: N= 27°08'35.06" & E=94°53'57.57"). The project site is well connected through roadways, railways and airways. Nearest train stations are Moran Town (5 KM), Sivasagar (45 KM), Dibrugarh (45 KM) & Simaluguri (40 KM). Nearest airports are Dibrugarh (55 KM) and Jorhat (102 KM). The total area of the plot is 80 Bigha approximately. The project is planned to be executed in EPMC+EPC mode.

EPMC to provide Services for this Tank Farm project in accordance with the given Scope of Work (SoW) in this section. This section establishes the scope and schedule for the work to be performed by the EPMC and describes the guidelines, instructions etc., which the EPMC shall satisfy or adhere to in the performance of the work.

The scope of work as indicated and elaborated hereunder is for general understanding and are not exhaustive. The BIDDER has to carry out all activities for completion of the project in totality.

Typical climatic condition of the region:

Month	Average Rainfall (in cm)	Average ambient temp. high/Average low (in deg C)
January	3.7	24 /11
February	5.4	25/13
March	10.5	27/17
April	19.2	28/20
May	30.1	31/24
June	32.7	33/27
July	38.1	34/28
August	32.9	34/28
September	27.9	33/26
October	13.0	31/22
November	3.6	28/16
December	2.2	25/12
Average	18.275	29.42/20.33

2.0 BASIC PROCESS PHILOSOPHY FOR THE PROPOSED SECONDARY TANK FARM, MORAN:

Proposed Secondary Tank Farm-Moran (STF-Moran) will have an installed crude oil storage capacity of 30,000KL. The Tank Farm will receive wet crude oil of around 2,000 KL per day (average 20% water content) from various installations for storage and dehydration to achieve BS&W content of less than 0.2% and onward dispatch to nearby Central Tank Farm-Moran (CTF-Moran). The produced formation water will be dispatched to an upcoming ETP, which will be installed at CTF-Moran (not under the scope of the current tender). Design and installation of wet crude handling system (wet crude oil storage tanks, crude oil dehydration facility including recirculation/recharging pumps, bath heaters for wet crude oil, electrostatic emulsion treaters, etc) and formation water handling, (Untreated Formation Water Tanks) is also included in the current scope of the project. Design & laying of dry crude oil receiving as well as despatch cross country pipelines are excluded from the project scope. Only tie -in flange with positive isolation valve for hooking up the cross-country pipelines to be considered.

2.1 FEED DATA FOR ASSESSMENT OF REQUIREMENT:

i) Inlet manifold for receiving 5,000 KLPD wet crude oil.

ii) Individual Capacity of wet and dry crude oil storage tanks - EPMC to suggest (preferably 5,000 KL X 2 nos. and 10,000 KL X 2 nos.).

iii) Capacity of crude oil dehydration facility: For handling 5,000 KLPD wet crude oil (BS&W 20%).

iv) Capacity of untreated formation water storage tank: EPMC to suggest.

v) Dry Crude dispatch pumping system to CTF-Moran

vi) Untreated formation water transfer pumping system to CTF-Moran.

3.0 DESIGN STANDARDS TO BE CONSIDERED:

The tank farm shall be design by considering applicable relevant codes, standards any other national & international level Codes & Standards applicable for design and construction of Crude Oil Tank Farm Installations but not limited to the following:.

(a) OMR (Oil Mines Regulations)
(b) Applicable OISD Standards (OISD 117, 118 etc)
(c) Indian Boiler Act guidelines
(d) Applicable IS codes.
(e) Recommendations of OISD (Oil Industry Safety Directorate)
(f) CMRI (Central Mining Research Institute)
(g) DGMS (Director General of Mines and Safety)
(h) PESO (Petroleum & Explosives Safety Organisation)
(i) Ministry of Environment and Forest (MOEF)
(j) State Pollution Control Board
(k) LMD (Legal Metrological Departments)

(l) MB Lal committee recommendation
(m) Hazira committee recommendation
(n) NPFA 72 & NPFA 2001
(o) API 650, API 610, API 674, API 676 and all API standards applicable for selection pumps, agitators, tank construction and all major items & equipment.
(p) Applicable ASME code.
(q) Latest applicable QHSE-ISO and International Safety Rating System (ISRS; Minimum Level-7 ISRS).
(r) Other relevant laws, by-laws, or Acts in force
(s) Any other national & international level Codes & Standards applicable for Crude Oil Tank Farm Installations
(t) Central Electricity Authority, Ministry of Power

4.0 Minimum list of facilities envisaged in this project but not limited to the following:

List of facilities and ancillaries required to be considered in FEED/Basic engineering design for the STF Moran but not limited to the following (EPMC shall consider any additional facilities for safe and efficient operation of the Tank Farm): -

4.1 Wet and Dry Crude Oil Storage Tanks:

The tank farm shall have wet and dry crude oil storage capacity of about 30,000 KL, preferably 5,000 KL X 2 nos. fixed roof and 10,000 KL X 2 nos. floating roof (double deck type or pontoon type) API 650 crude oil storage tanks. The capacity of proposed tanks as mentioned herein is not to be considered as final. EPMC shall give exact capacity of tanks with due consideration of space availability. Based on land shape and space availability, EPMC to suggest exact capacity of wet and dry crude storage tanks and number of tanks feasible to be installed inside the project build up area. Other associated systems like Impressed current cathodic protection (ICCP) system, Tank dykes for spill containment are also to be considered.

4.2 Crude oil Dehydration Facility:

Crude oil dehydration facility including recirculation/ recharging pumps, bath heaters for wet crude oil, electrostatic emulsion treaters, etc. for handling 5,000 KLPD wet crude oil (BS&W 20 %).

4.3 Crude Oil Despatch Pumping System (CODP system) with structural shed: -

Stored dry crude oil from the dry crude storage tanks will be dispatched to CTF-Moran with the help of Natural Gas Engine Driven crude oil despatch pumps (CODP). CODP system shall be equipped with suitably sized adequate quantities of COD pumps including 50% standby. All the COD pumps shall be identical capacity/rating and same make. The pump units must be isolated by the sound barrier to arrest any sound pollution to the optimum level (i.e. 75 db at 1 meter distance from acoustic enclosure).

Enclosure, if provided, should have adequate space inside the enclosure for movement of maintenance crew for carrying out scheduled/ unscheduled and major breakdown maintenances involving removal and assembling of heavy pump components within the enclosure. Enclosure should have adequate ventilation options for maintenance works and should have provision of easily removable parts or top open type with minimum involvement of shifting electrical/air/ other system lines for safe and easy transfer of heavy components/ complete pump/ gear box assembly. Walkways around the equipment should be designed for safe and unrestricted movement of manpower with tools.

EPMC shall suggest type of CODP-Centrifugal/ Reciprocating type. If required, EPMC also shall consider EMD centrifugal type Booster/ Charge pumping system to meet NPSH requirement for each COD pump. 50% standby philosophy shall be considered for Booster/Charge pumps. All the Booster/Charge pumps shall be identical capacity/rating and same make. DCS shall be considered for monitoring and control operations of all the CODP and Booster pumps from the Control Room. Local push button station (LPBS) also shall be considered for each booster pump operations. All critical operating parameters of CODP & BOOSTER PUMPS (pump suction pressure, pump discharge pressure, pump discharge rate, motor RPM, voltage, current etc) shall be displayed in the control room.

Adequately sized pre-engineered structural sheds or site fabricated structural shed shall be considered for the entire CODP system including booster pumps. Additional floor space shall be considered for carrying out regular maintenance/breakdown repairing/overhauling of one pumping unit inside the pump shed. The pump shed shall have EOT crane of adequate capacity with palm top facility for lifting each CODP unit along with prime mover. The shed shall have removable parts for lifting of the pump/ gear box/ prime mover assemblies through mobile cranes. There should be adequate space and accessibility to movement of crane and heavy vehicles along the CODP equipment area.

There should be proper drainage system in and around CODP area to cater to all probable fluid spillage / draining locations.

It suggested that minimum tank crude oil level or tank foundation level to be maintained above CODP suction level as per the requirement of the pump manufacturer to avoid suction starvation. Suction and delivery pipelines should have minimum flow restrictions to ensure smooth flow.

4.4 **Distributed Control System:**

DCS based C&I system shall be considered in the design for monitoring and controlling from the Control Room. Controls and Status (Running / Standby / Trip / Start Permissive etc.) of all the COD Pumps, charge/booster pumps & motors, all other utility pumps & motors, fire pumps, EDG, tank inlet & outlet ROSOV, MOV operation, tank level

display, tank status display, display running/standby status of steam generating boiler, display all operating parameters of rotating equipment (pressure, temperature, RPM, voltage etc), crude oil despatch rate shall be incorporated in the DCS for monitoring and controlling from the Control Room.

Following control system envisaged for the tank farm-

- ✓ Tank farm management system (TFMS)
- ✓ Basic process control system (BPCS)
- ✓ Fire water Protection system
- ✓ Rim seal fire protection & suppression system
- ✓ ESD system (Emergency shut down/SIS)
- ✓ Flame and Gas Detection system (F&G/SIS)

DCS should be compatible for establishing communication between the two basic process control system (BPCS) of the tank farms (STF-Moran and CTF-Moran) as well as Pump Station-2 (PS-2). Establishing communication between BPCS of STF-Moran with CTF-Moran as well as with PS-2 shall be included in EPC contractor's scope.

4.5 **Electrical Power Supply:**

OIL will provide a maximum of 400KW power for the proposed STF-Moran. EPMC to estimate the electrical load of the plant and suggest additional Gas Engine Driven Generating sets (GEG), if required. One Emergency Diesel Genset (EDG) shall be considered in the design for entire plant illumination, power supply to DCS, power supply to instrument air system and power supply to instruments in case of black out situation.

EPMC to estimate the total electrical load of the plant and accordingly suggest Gas Engine Driven Generating sets (GEG) or Power from Grid or Power from Existing Captive Power Plant (subject to availability of power upto 400 KW considering no additional projects in Moran Township) to cater load demand of the STF Moran from existing Captive Power Plant. One Emergency Diesel Genset (EDG) shall be considered in the design for entire plant illumination, power supply to DCS, power supply to instrument air system and power supply to instruments in case of black out situation.

EPMC shall furnish the data in the following manner:

a) Total Connected load in kW

Category wise load shall be furnished.

b) Maximum running load at one time (Peak) in kW

Category wise load details shall be furnished.

c) Diversity factor

If power to be provided from the existing captive power plant, then power distribution shall be done at 11 kV. Corresponding upgradation/ modification of upstream power system need to be carried out and same

shall be under the scope of EPC contractor. Detailed planning and scope of work as far as electrical power system is concerned shall be done before finalisation of the EPC tender specification.

4.6 **Crude oil heating system-**

Steam Generating Boiler for tank heating and process piping (100 % standby philosophy shall be considered in the design if 01 boiler is sufficient for regular operation, 33% standby philosophy shall be considered if 02 boilers are required for regular operation and 50 % standby philosophy shall be considered if 04 boilers are required for regular operation).

4.7 **Fire Protection System & Fire Fighting System:**

Following shall be considered for basic engineering design of fire fighting system-

4.7.1 The proposed Tank Farm at Moran shall be equipped with state-of-the-art firefighting facility which should include, Fire Extinguishers (DCP & CO2), Sand Buckets, Fire Pumps (Diesel Engine + Electric Motor Driven), Jockey Pumps (Electric Motor Driven), Foam Pumps (Diesel Engine + Electric Motor Driven), HVLRMs (Manual / Remote Operated), Water Spray System, Rim Seal Fire Protection System, Fire Suppression System (Clean Agent System), Lightening Protection System, Hydrants, Monitors, Fire Detection and Alarm System, Public Address System etc. as per relevant National's & International's codes & standards but not limited to the following- OMR-2017, OISD-117/118/163/173/244/etc., BIS, NPFA-15/20/25/72/2001/etc., API, PNGRB etc.

4.7.2 All firefighting pumps shall be in auto mode and of same make & capacity. Entire area of the tank farm shall be covered with Fire Water Ring Mains with alternatively Fire Hydrants (Double Headed, Type-B, IS-5290) along with Fire Hose Boxes (Which includes Synthetic Fire Hoses (IS-636)-Type 'III', 15m-02 Nos. and Multi-Purpose Nozzles-01 No., UL/FM Approved) & Water Cum Foam Monitors (500-750GPM, UL Listed) at a regular spacing as per the relevant norms. The entire fire water ring main shall be in closed loop with intermediate isolation valve and maintained at minimum 7 Kg/cm2 pressure at a hydraulically remotest point. The fire pumps shall be in auto mode and shall have a hydro-pneumatic tank and air compressor along with the jockey pump.

4.7.3 The jockey pump shall start automatically when level in the hydro-pneumatic tank falls below the low level and shall stop when normal level in the tank has been restored. Pressure switches are to be provided in the hydro-pneumatic tank for automatic operation of the air compressor.

4.7.4 Moreover, for jockey pump duty type of the motor shall be selected based on the cycle of operation of the jockey pump. If felt, a timer can be introduced in the control circuit to keep the motor running for a predetermined time after each automatic start to avoid too frequent motor

operation.

4.7.5 For cooling purpose, multi-feeder type medium velocity water spray with multiple rings arrangement shall be provided for each crude oil tank as per relevant norms (OISD-STD-117 & NFPA-15).

4.7.6 Foam System for tank protection shall be of semi-automatic type with centralized foam storage facilities (having UL listed fluro protein foam with foam filling pump) and foam ring main around the tank dyke area with online foam induction arrangement through suitable foam inductor/proportioner (ILBP). Provision for alternate foam pouring arrangement through fire tender in case of failure of the semi-automatic system shall be considered in the design. All the foam equipment (foam pump, maker, inductor, proportioner etc.), piping, fitting, foam tanks etc. shall be of stainless steel (SS-316/304) of suitable grade. A platform shall be provided on the tank shell to facilitate periodic foam testing of the foam pourers.

4.7.7 MEFG shall be considered in the design for spillage protection inside the dyke.

4.7.8 A crude oil storage tank shall be constructed as per suitable norms. The platform shall be provided for inspection and maintenance of foam pouring system.

4.7.9 Entire fire hazard area shall be covered with fire detection and alarm system (Addressable Type) with manual call points at strategic locations. Fire alarm panel will be placed in Control room.

4.7.10 Automatic fire detection cum alarm and suppression system shall be considered in the design for protection of control room. A clean agent fire suppression system shall be provided as per NFPA 2001.

4.7.11 There shall be "Above Ground Fire Water Storage Tank" with minimum 4 (four) hours storage capacity to cater double contingency if the total crude storage capacity exceed 30,000KL for the entire STF facility including crude oil storage tanks, wet crude storage tank, crude oil dehydration trains and all ancillary facilities of the STF Moran.

4.7.12 Apart from the above, the entire tank farm shall be equipped with first aid firefighting equipment as per Clause No. 4.6.3.iii and Annexure -VII of OISD-STD-117. Including SCBA Set (2 Nos.) with Dis-stress Signaling Unit of 45 minutes capacity. All other miscellaneous items related to fire & safety shall be considered as per relevant norms.

4.8 **Instrument & Utility Air Supply**: For supplying instrument air to all pneumatically control instruments, EPMC to suggest/consider adequate capacity & pressure rated Oil Injected Type Screw Compressor. Based on actual instrument air requirement, EPMC to suggest either 1 (operating)+ 1 (stand by) or 2 (operating)+ 1 (stand by) or 3 (operating)+ 2 (stand by) air compressors in the design.

It is suggested that minimum 02 nos. (or more based on no. in operation) stand by air compressor along with adequate standby air dryer systems should be considered, due to the critical nature of the equipment.

The site shall be made easy accessibility for the loading and unloading of compressor packages and its accessories with sufficient working space between the equipment for safe and efficient operation and maintenance.

4.9 **RCC Office building and Control Room Building:** Adequately sized Administrative Office/Plant in charge building shall be designed as per OISD STD 163 Clause no. 5.2.

The control room building shall be designed as per OISD-STD-163 and OISD-STD-118. on the ground floor.

Note: Two separate RCC buildings shall be considered for the Office building and Control Room Building. The control room building shall be a single storied building. For Office building, EPMC to decide whether single or double storied depending on office accommodation requirements.

4.10 **RCC Sub-station building:**

A RCC Electrical Sub-Station building including all HT switchgear panel, **Station transformer (2 Nos.)**, LT switchgear panel, lighting transformer, LDB etc shall be considered in the design to feed Electrical Power Supply to entire process, ancillaries, utilities, buildings, sheds.

Substation area shall be considered including the earth electrodes.

Low lying area or area with water accumulation shall be avoided for construction of RCC sub-station. Area shall be isolated with boundary wall to restrict the entry of unauthorised personnel.

RCC substation shall be designed confirming the guidelines of CEA.

4.11 **Structural maintenance shed** (Size: 40 ft x 20 ft, indicative)

4.12 **Structural Equipment Storage Shed** (Size: 25 ft x 15 ft, indicative)

4.13 **POL Storage Shed** (Size: 25 ft x 15 ft, indicative)

Note: All structural shed may be either pre-engineered structural shed or site fabricated structural shed.

4.14 **Water supply system:**

a) Source of water: Ground water (Deep Tube Well / Shallow Tube Well).

b) Necessary arrangements are to be considered for treatment of raw water including iron removal filters to use it as potable water and for industrial (excluding water demand for firefighting system) purpose.

c) Overhead water storage Tank: Two separate Overhead Storage tanks of adequate capacity for potable and industrial water should be provided.

4.15 **Civil Foundation:** Civil foundation for all tanks, structural sheds, pipe

rack, cable trench, mechanical, electrical & instrumentation systems / equipment, etc.

Pacca Cable trench shall be designed such that no water accumulation takes place, kept free from any obstruction, and comply the relevant standards.

Cable route, construction of cable trench from electrical source, procurement of cable, cable laying and termination shall be under the scope of contractor.

4.16 **Boundary Wall**: 10+2 ft high Peripheral Boundary Wall including 2 ft high Y-angle framed concertina coil atop the wall shall be considered in the design. Boundary wall shall have one main Entry gate and one emergency Exit gate. EPMC may suggest either of the following types of boundary wall- Brick type or pre-fabricated RCC slab type boundary wall. OISD 118 to be followed for maintaining minimum distance from the boundary wall.

4.17 **Road & Drainage System:** EPMC shall consider main entry road, ring roads, internal road and drainage systems in the design. Drainage system shall be designed for zero effluent discharge outside the plant area. Sewage Treatment Plant of suitable capacity (EPMC to decide the capacity) for treatment of wastewater generated from security barrack, office building etc. shall be considered for achieving the same.

RCC Block Road shall be considered. Carriage width of the plant approach road (from main road to the entry gate and from exit gate to main road) shall be 5 m with 1 m side berm on either side. Carriage width of the plant ring road shall be 4.5 m with 1 m side berm on either side. Carriage width of the plant internal road shall be 4 m with 1 m side berm on either side.

4.18 **Security Check Post & Security Watch Tower**:

One RCC security check post (size 3 m x 3 m) near entry gate and one near emergency exit gate shall be considered in the design.

Adequate nos. of structural steel security watch towers shall be considered in the design.

4.19 **Development of Green Belt:** EPMC to consider green belt in the design as per CPCB/SPCB norms and any other relevant norms.

4.20 **CCTV System with recording & transmission facility:** Intrinsically safe CCTV system suitable for Oil and Gas plant shall be considered in the design. Adequate nos. of CC camera shall be considered for coverage of critical process areas, near entry & exit gate, pump shed, control room, GEG shed, lobby area of office building. CC camera also shall be considered at strategic locations for surveillance of outside plant boundary wall nearby areas. The memory card of CC tv system shall capable of storing data for minimum 30 days period. The system shall contain on LED Display screen for real time displaying of all camera output.

4.21 **High Mast and Area Lighting**: LED lights shall be considered for all high

mast and area lights.

4.22 **Lightning Protection**: Design of appropriate lightning protection systems for the entire plant (covering all the structures, buildings etc.) as per statutory requirements and IS/IEC 62305 shall be considered in the design. This also includes bypass conductors on floating roof tanks and lightning protection to all the crude oil storage tanks as per requirements of OISD-GDN-180. Preparation of a comprehensive report of all the installed lightning protections installed in the plant, along with risk assessment shall be included in EPC tender scope.

4.23 **Earthing:** All the earthing works shall be as conforming to IS 3043-2018 and IS/IEC 62305.

4.24 **Rooftop Solar Panel:** Rooftop solar panel with battery on substation building and other feasible location shall be explored. Solar panel shall have the facility of remote monitoring.

4.25 **Mandatory spares & critical spares**: Supply of mandatory and critical spares for 02 years of scheduled and unscheduled/ emergency maintenance for all mechanical, electrical & instrumentation system should be included in EPC contractor's scope.

5.0 SCOPE OF WORK UNDER EPMC CONTRACT:

As an EPMC for the job, the consultant shall act as an extended hand of OIL, always keeping in view OIL's interests and advising/guiding OIL on all important matters and efforts should be given for timely completion of the project. The Detail scope of work of EPMC is outlined below. However, the list is not exclusive/exhaustive and limited. EPMC shall also be required to do the work as a consultancy service provider not envisaged herein and specifically mentioned below, but otherwise required for overall completion of the project.

Scope of work (SoW) in brief for the EPMC service are mentioned in below para- "***a) SoW- Pre award of EPC contract"*** and "***b) SoW- post award of EPC contract"*** for quick understanding.

a) SoW- Pre award of EPC contract (SOR&P Line Items 10 to 50):

- Conceptual design.
- Preparation of Basic design & FEED of the plant.
- Field survey for collection of HFL, NGL etc& finalization of FGL.
- Soil investigation/soil testing, contour mapping/ topographical survey, hydrological survey.
- Conducting safety studies on basic engineering (HAZOP, HAZID, SIL, QRA).
- Preparation of L4 project schedule for all EPC activities till commissioning & PGTR and recommend optimum EPC timeline for the project.

- Preparation of cost estimate for EPC tender,
- Preparation of EPC tender document for hiring EPC services for carrying out Detailed Engineering, Procurement, Construction, Fabrication, Erection & Commissioining in accordance with the terms of the EPC contract.
- Attending pre-bid meeting for the EPC tender. EPMC shall preside the pre-bid meeting and record minutes of meeting.
- Preparation of pre-bid queries response.
- Evaluation/scrutiny of techno-commercial bids received against the EPC tender and recommendation for opening of price bids of techno-commercially accepted bids.
- Evaluation of price bids & recommendation for award of the EPC contract for the suitable bid.
- Preparation and submission of EPC Contract Agreement to OIL.

b) SoW- post award of EPC contract (SOR&P Line Items 60 to 80):

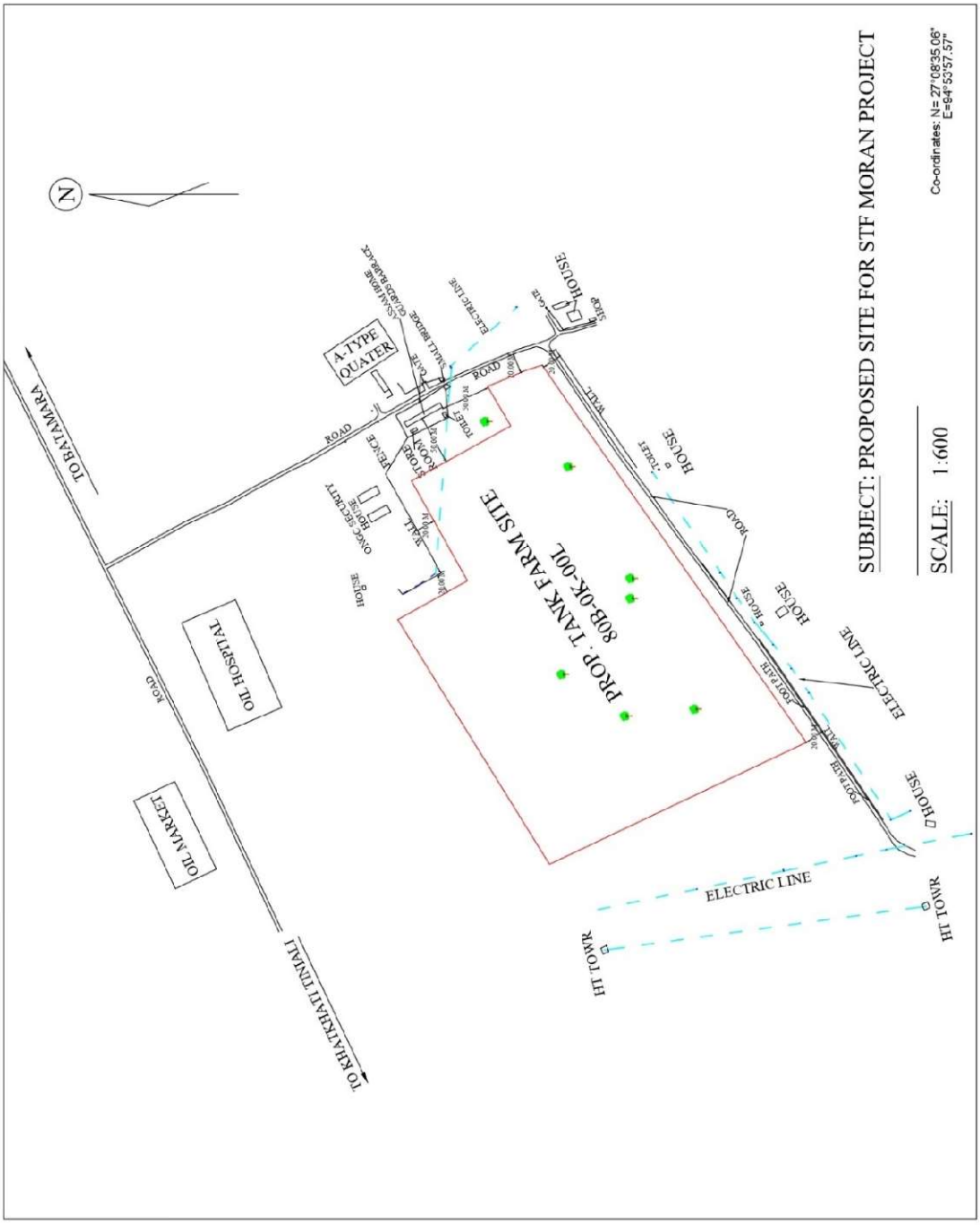
- Review and approve all detailed engineering drawing & documents of EPC contractor,
- Validation of design data,
- To attend safety studies-HAZOP, HAZID, SIL, QRA on Detailed Engineering at EPC contractor's place.
- To attend 30%, 60% & 90% model review meeting at EPC contractor's place & provide approval to the model.
- Verification of OEM drawing & documents,
- To give manufacturing clearance,
- Witness FAT of materials & equipment whenever instructed by OIL,
- Review of MTC/FAT report of all materials & equipment, issue IRN/MDCC to EPC contractor prior to dispatch of major materials & equipment identified as per Inspection Categorization Plan (ICP) approved by EPMC for materials and equipment to be used,
- Inspection of incoming materials at site prior to use for construction/erection/installation,
- Stage wise inspection of all site construction activities to ensure all activities are being carried out by EPC contractor in accordance with AFC drawings and in accordance with the terms of EPC contract.
- Generation of IMIR,
- Review of daily progress, conduct weekly progress review meeting (WPR)

with EPC, conduct monthly progress review meeting (MPR) with EPC, prepare catch-up plan for delayed activities in consultation with EPC

- Certification of monthly invoice of EPC contractor prior to release payment to EPC contractor by OIL,
- Verification of compliance of Statutory requirements,
- Verification of compliance of various standards applicable for oilfield equipment and installations,
- Verification of compliance of all applicable statutory regulations. Statutory norms and standards to be considered are not limited to the following- OMR, OISD, India Boiler Rules, IB Norms, CPCB/SPCB, NPFA etc.
- EPMC also shall monitor, supervise & certify all site construction activities of EPC contractor right from the beginning of site mobilization activities of EPC contractor till project commissioning, PGTR and project completion to ensure safety, quality and workmanship of entire construction works as well as reliability of the plant.
- Preparation and submission of **Quarterly Delay Analysis Report** of EPC contract (if any).
- Review and approval of As-built drawings.
- EPMC shall prepare Project Closure report including final delay analysis of EPC contractor (if any).

6.0 Proposed Site Land Map:

Annexure-B: SCOPE OF WORK (SoW)



End of Annexure-B